

GeoVisualisation of Football Movement

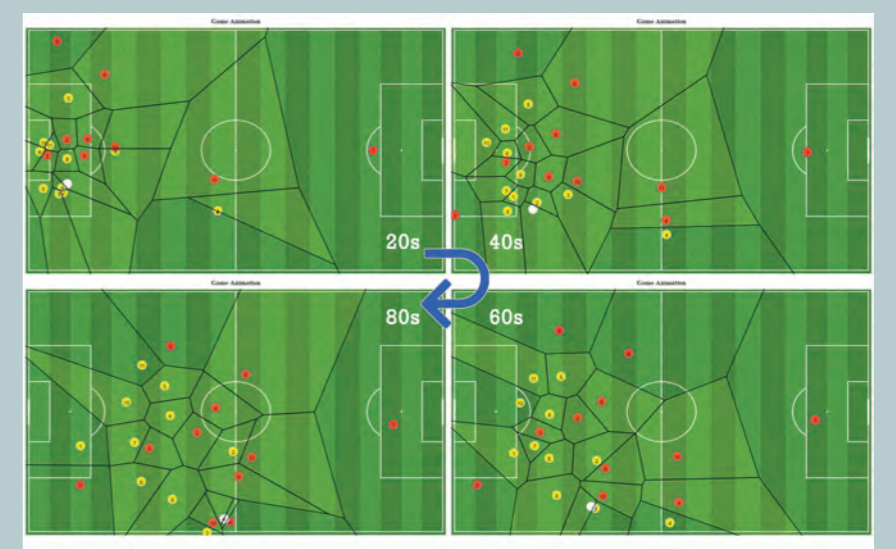
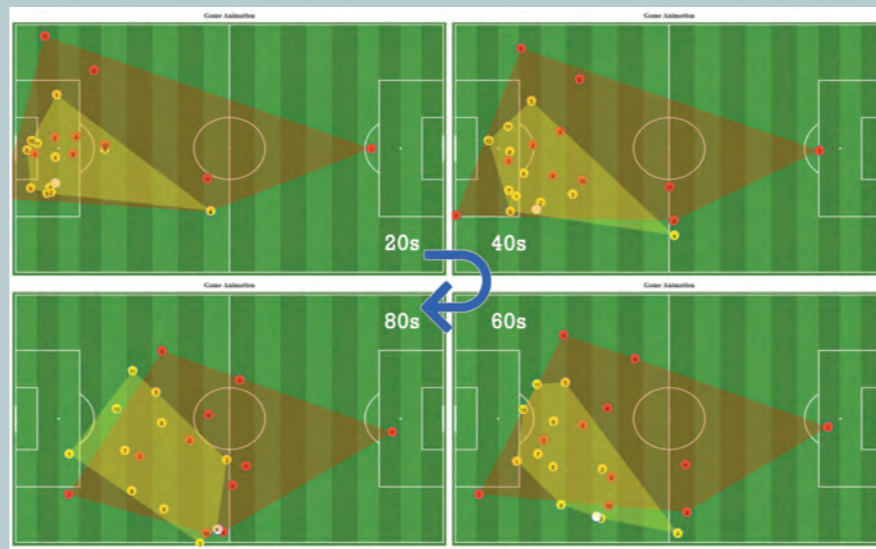
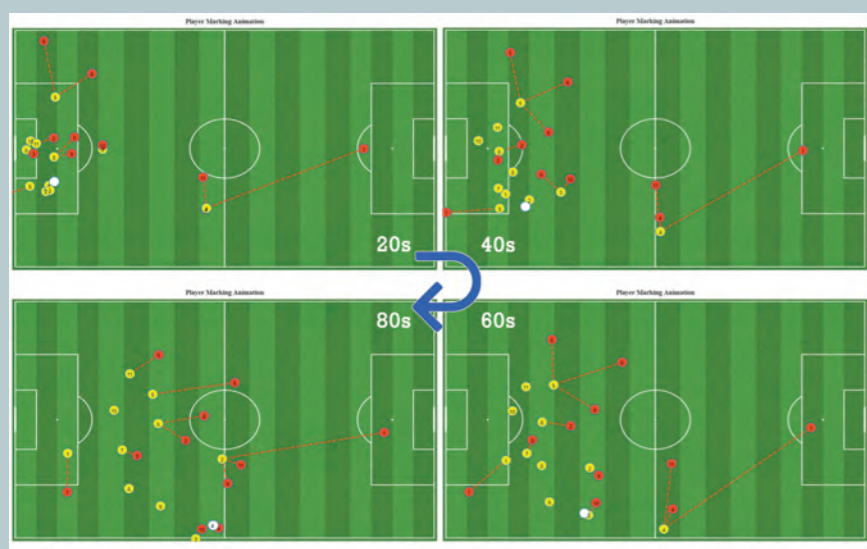
Objectives

The aim of this thesis is to analyse, compile, and compare a set of football visualization and animation in different methods. The main part of the content establishes a systematic concept for all the football visualization charts, diagrams, statistic graphs, and animations. Spatial and attribute information of football datasets including positions, tracking, and tactical statistics is briefly introduced. The essential steps of visualizing football data through different technologies are described and important findings are shared. Then, the efficient workflow of football animations based on different technologies (e.g. Python, R, HTML5) is explained in detail, as well as evaluates the solutions of Tableau, ArcGIS, Adobe After Effects, and QGIS. Finally, the tactical, valuable, and understandable information to football coaches and players, delivered by Geovisualisation context, are interpreted and discussed.

Methodology

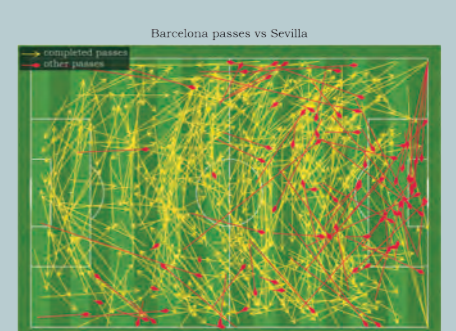
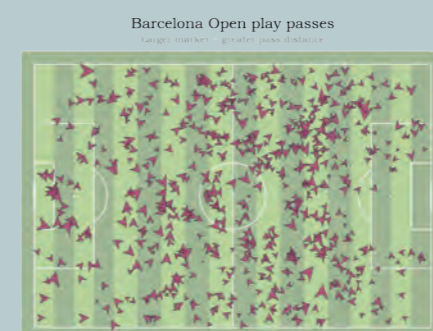
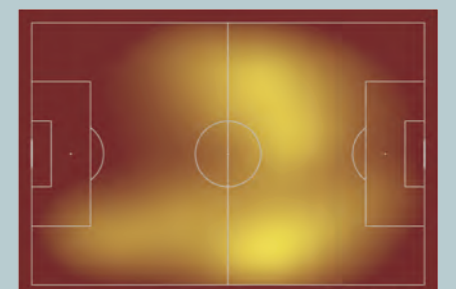
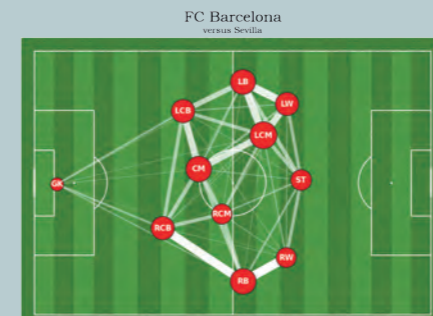
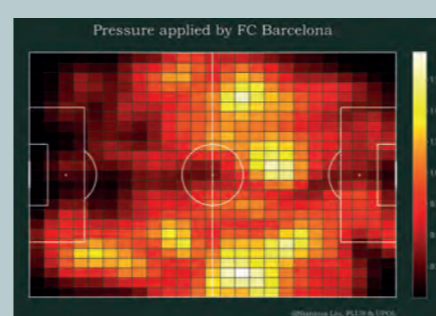
First, visualization work of statistic information is introduced to explore some popular football visualization works without the pitch map. A multitude of visualized examples for different applications is presented including charts, plots, diagrams, and statistic graphs. Second, some examples of spatial information are created to create to analyse how to highlight the players' location in visualization work. The essential steps to animate football data through different technologies are described and important findings are shared. The solutions built by Python, Web technologies, and R are introduced in detail. Each animation constitutes a unique target group and user scenario. Some other solutions built by Tableau, ArcGIS, Adobe After Effects, and QGIS are also evaluated. The limitations concerning these methods are also documented.

Animation



Visualization

Static football visualization represents the work presented in chart, diagram, graph, and map. The information that can be derived from each static visualization are various. Thus, they are separated into three groups — Statistic information, Spatial information, and Spatio-temporal information. They are served for different target users which applied in different user scenario.



Conclusion

Solution	Strength	Application
Python	In-depth analysis; Tactics analysis	Pre-game and post-game analysis
Web	Interaction; Customized setting	Cross-browser and platform; Real-time tactics
R	Low threshold; Data standardization	Entry level practice; Dealing with popular data



Data acquisition



Data pre-processing

Creating a pitch map

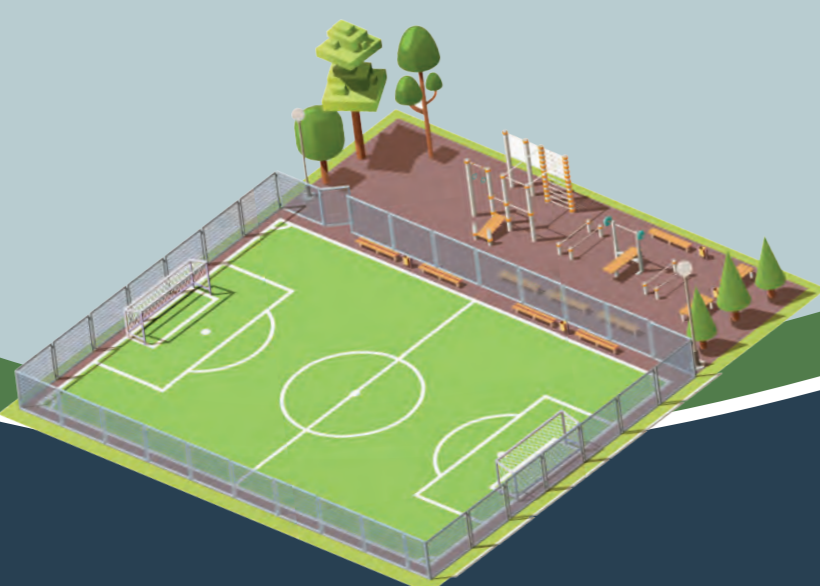
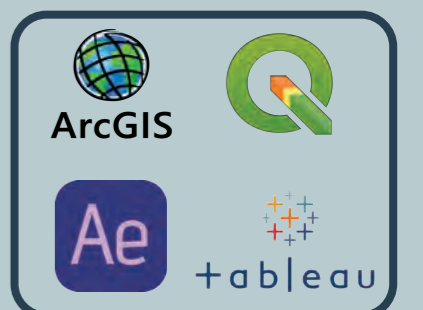
Static Visualization

Animation Case Studies

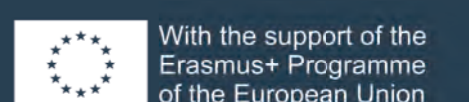
Spatio-temporal

Spatial

Statistic



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